approach

MAY 1976 THE NAVAL AVIATION SAFETY REVIEW

"I was flying as planned and filed on airways. I knew where I was and where I was going. However, when I was 40 miles from my destination, I was given radar vectors. My scan quickened and I started tuning in various VORTACs to keep track of my position. The next vector came with a descent which put me in the clouds. I got tense. The field was about 40 degrees off to my left, but the controller kept giving me 5- and 10-degree heading changes. Finally, I gave up. Then it was easy; the controller had control, and I was just along for the ride."– Anonymous

Most pilots will confess, in these days of radar vectors by Center and Approach controllers, that there are too many times when they don't know where they are, they aren't sure of the height of the terrain below them, and they are often behind their aircraft.

This article recognizes the problem of the pilots and is a proposal by the author of one way he would like to see some changes made.

Radar-Directed Routing and

By LT Daniel E. Graham, USN
VA-128

COMPLACENCY, or the willingness to read back and comply with any controller instruction without further evaluation, isn't a professional approach to instrument flying. It may be a defense mechanism to prevent confusion. Being confused is a healthy reaction, but it is also very stressful. What is that guy trying to do to me? Where are we going? Have I lost comm or been forgotten? If the confusion is not resolved, the pilot may eliminate the stress and become complacent.

It's refreshing to see that the National Transportation Safety Board recommendations stemming from the crash of TWA Flight 514 near Dulles appear to be primarily directed toward improving the information available to the pilot (i.e., expansion of chart profile, standardization of charts, ATC glossary, etc.). I'm sure that there is also considerable effort being expended in developing tools for the pilots, such as putting terrain height or minimum vectoring altitude information on IFR charts and defining and publishing more STARs and/or Preferred Arrival Routes. One additional area that I feel should be addressed is that of aircraft navigational control while receiving radar services.

Flight is dynamic, and navigation is more than just what is interpreted from the cockpit instruments. A point in space is a picture which is incomplete unless the vertical and horizontal velocity vectors are also envisioned. Due to the proximity of the terrain, a means must also be available to correlate the position/velocity vector with the terrain to competently navigate. Even when he is receiving random or off-route radar vectors and is effectively being navigated, the pilot needs to know where he is going, to project ahead and evaluate the total navigation problem.

Both TWA 514 and the MAC C-141 which crashed in the Olympic Mountains of Washington appear to have been CFIT (controlled flight into terrain) accidents. A

common contributing factor may have been lack of awareness of ground track. The TWA crew, flying direct to intercept an extended centerline for the approach procedure, thought they were cleared to 1800 feet. The VOR/DME approach procedure chart used in the cockpit depicted the 1764-foot peak into which the aircraft crashed. The MAC C-141, on a radar vector, was erroneously cleared to descend from 10,000 feet to 5000 feet. The IFR navigation charts do not depict the Olympic Mountains, but the McChord-based crew should have been aware of the 7000-foot-plus mountains located less than 50 miles from their homebase.

The air traffic controller is responsible for the safe and expeditious flow of traffic. One of his best tools is the authority to request that the pilot deviate from his planned speed, altitude, and route, thereby allowing a greater volume of traffic to flow safely over a given area. He is also allowed to descend aircraft under radar control to minimum vectoring altitudes, which are derived from entirely different criteria than the published minimum sector altitudes and minimum enroute altitudes.

In the radar control environment as it exists today, the pilot must not only navigate from point A to point B as planned and filed, but also must be prepared for a series of vectors which usually compound the navigation problem by causing him to fly off a published or planned route. These vectors normally occur in the transition from the enroute to the terminal arrival phase and often begin as far as 100 miles from the destination.

Proposed Definitions

Radar-Directed Routing – Off-airway routing which is defined by radar vectors and/or radar-recommended headings and by a clearance for return to a defined published or flight plan route or procedure.

Radar Vector – Heading and vector end-point (time to go or distance to go) issued to an aircraft to provide navigational guidance by radar.

Radar-Recommended Heading – Heading to fly to a specific point (fix, intersection, navaid) and, upon reception suitable for navigation, the aircraft is cleared to proceed direct.

Some Examples – Navy NJ821 expect Radar-Directed Routing for Runway 24 precision approach at Navy Whidbey . . . Vector heading 305 degrees, 70 miles, thence Whidbey TACAN . . . Navy NJ821 left 210 degrees, 2 minutes for traffic . . . Navy NJ821 recommended heading 010 degrees for Lofal intersection, thence Whidbey TACAN.

Terminal Arrival Depiction

All too often the pilot throws his publications on the glare shield, blindly follows the controller's directions, and, in 99 percent of the cases, is positively reinforced by virtue of an uneventful approach and landing. The system today actually encourages this type action, in that the pilot doesn't have enough information available to competently navigate his aircraft. The specific radar vector has only one dimension of definition – a heading. The pilot cannot determine where he is going, only in what direction. He cannot tie a vector to the clock because of the lack of end-point definition. Neither can he enter it as a way point in his R-Nav nor define it to his INS computer. And he cannot plan it as a point-to-point.

It is very easy to fall into the trap of assuming that the navigation problem is over once radar vectors are received. By being lulled into complacent and docile acceptance of "radar control" (remember there is no official term defining full radar services), we are sacrificing our most potent tool for safety of flight – an alert, completely informed, competent pilot.

I feel that the advantages of route familiarity should be available to all pilots, through terrain height or minimum vectoring altitude depictions, the use of published routes, and through more complete information while under "radar control." I propose that the unnamed "radar control" be named "Radar-Directed Routing" *to emphasize the requirement for a route of flight while receiving full radar services.* A clearance point should be given for a series of radar vectors, and each specific vector should have a defined end-point.

The Terminal Arrival Depiction (Fig. 1) is designed to be used in conjunction with Radar-Directed Routing to

enable the pilot to visualize his projected flightpath when he is *not* on a published route, such as during transition from the enroute phase to the terminal arrival phase of flight. A Terminal Arrival Depiction should be published for every airport with an instrument approach procedure and should be contained with that airport's approaches in the inflight publications.

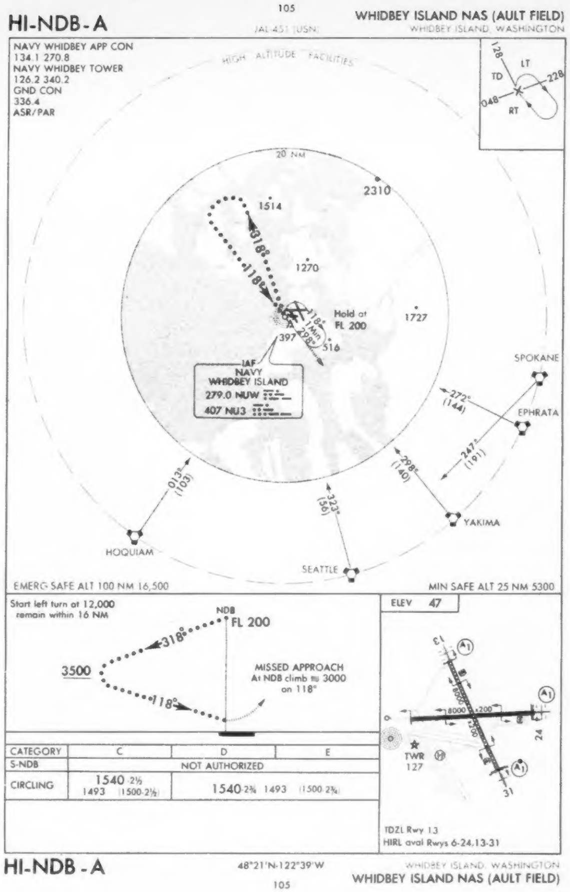
The Terminal Arrival Depiction is blocked out according to terrain height, and the figure in the block gives the lowest allowable vector altitude, in hundreds of feet, for that area. This information is taken directly from the minimum vectoring altitude charts used by the air traffic controllers; thus the pilot has access to the same information about minimum altitudes as the

controller. The pilot therefore knows that the altitudes depicted on the chart are true stop signs and cannot be violated by any controlling agency in the area.

The scale of the depiction (1 inch = 38 nm) is identical to the Hi-enroute charts, allowing easy cross-reference from the enroute chart to the Terminal Arrival Depiction. The altitudes in the hexagonal shapes represent the minimum altitudes within 100 nm of the facility, and the 90-mile radius of the chart allows the pilot to use the depiction when he receives his first off-airway vector in the transition.

The Terminal Arrival Depiction is designed to be used as a kneeboard-sized maneuvering board. The compass rose is centered on the arrival navaid and can be used for rough triangulation and quick visual interpretation of the heading/time/distance relationship of all points on the chart.

Every pilot's first reaction to this chart is that it's too cluttered and complicated to be used effectively. While it may appear that way at first, I have been using this type of chart at Whidbey for 2 years now and have found it very manageable and completely usable. True, you can't always pinpoint your exact position and correlate it with the small blocks on the chart, but you can keep track of your general whereabouts and take notice if you are assigned an altitude that is lower than



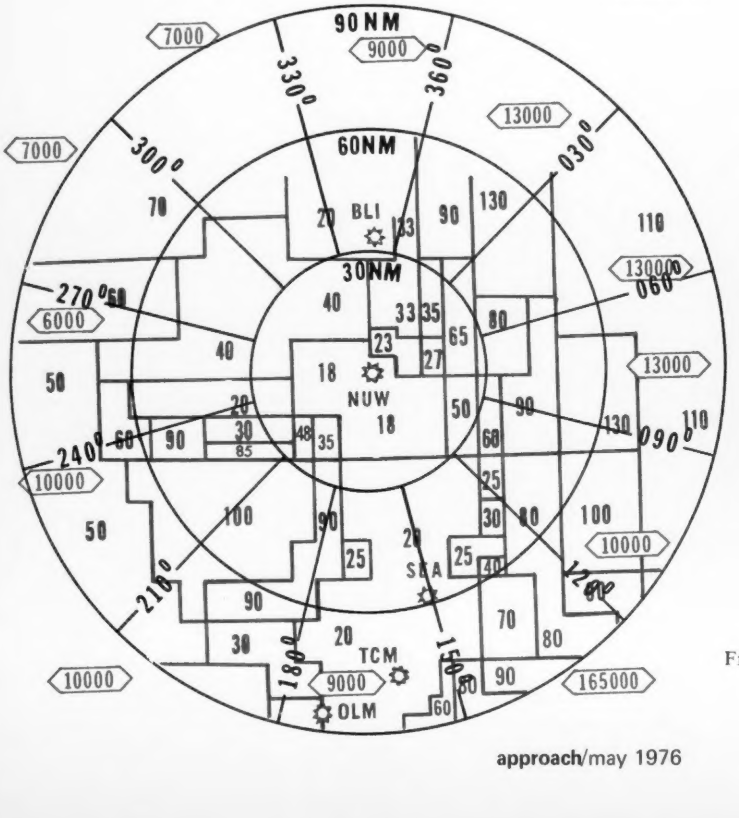


Fig. 1

anything you see in your general area. The problem of using this chart might be greater in a single-seat cockpit, but just the fact that you have minimum altitudes available to you puts you ahead of where we are now.

Historically, the cartographers have also been against this type of chart because it puts "VFR" information on "IFR" charts, resulting in too much clutter, and "the pilots wouldn't use it anyway." They're right on both counts, but we *should* "use it anyway" and may just have to live with the clutter. For reproducing the Terminal Arrival Depiction, I recommend a greatly subdued altitude grid, possibly in a light green with very light line weight. Other proposals for minimum vector altitude depictions show the altitude boundaries expanding from the middle of the chart, decreasing the clutter. I feel that in order to give the pilot an uncompromisable "minimum," we should depict the minimums actually used by not only the approach control but also the ARTCC controllers.

In conclusion, there is a need to encourage greater pilot participation in the navigational control of aircraft while in the radar environment. Prior to the widespread availability of radar services, the pilot was required to provide the controller with enough information to see the big picture. Today, the controller has the big picture, but the pilot is not informed and is merely given only enough information to act one step at a time. He is, therefore, a less-than-active participant.

Through the Radar-Directed Routing procedure and the use of the Terminal Arrival Depiction, the pilot would be given sufficient information to competently navigate his aircraft and evaluate clearances. *He would have the tools he needs to act as final authority for the safety of his aircraft, while realizing the benefits of traffic separation and time and fuel conservation which are afforded in the full radar services environment.*

FAA Comments

Radar service *is* defined in FAA Handbook 7110.8D. Radar vectoring *is* utilized to achieve either "radar separation" or "radar navigational guidance." Vectoring *may* be used in conjunction with a "radar advisory" to assist a pilot in returning to an authorized flight plan when the service being provided is "radar monitoring."

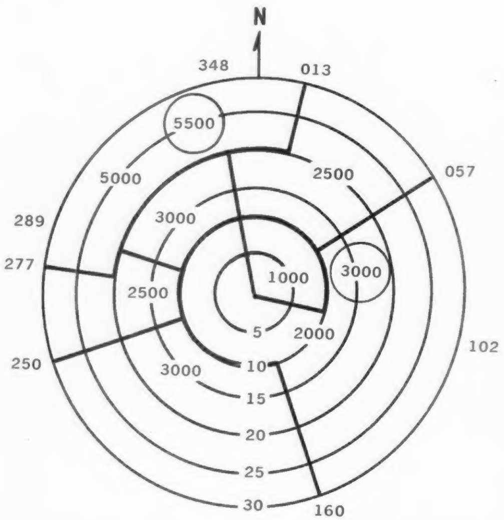
Off-route vectors, for whatever purpose, must contain information as to purpose and point to which the aircraft is being vectored. Intermediate sub-vectors may be utilized for "radar separation" without changing the original end point definition. A radical sub-vector should immediately excite the pilot to question it in accordance with FAR 91.75(a).

One must endorse any means that would contribute to an improvement in the safety aspects of flight operations. Pilot anxiety can be a definite minus quantity and should be allayed whenever possible. To this end a minimum vectoring chart on his kneeboard might serve effectively.

For years there has been a stress on relieving pilots of single-piloted aircraft of too much activity that requires visual attention to an operationally related task. Hence, cockpit/instrumentation layout design has been directed to permit him to perform these tasks by utilizing other senses than sight to the maximum extent possible.

Figure 1, accompanying LT Graham's article, would certainly require intense visual study for correlation with an assigned vector/altitude for a transient pilot. It might prove distracting to a homebase pilot until experience equipped him to make the correlation based on memory at which time he would not need the chart.

As a minimum, the chart should be simplified, as shown below. This chart depicts an example of the terminal adaptation of the MVA charts. You will note one principle that differs from LT Graham's idea. That is: The only straight lines are the radii oriented to the center index point. This overcomes the problem of having to calculate the highest value of any of the rectangles over which a given vector might take the pilot with the minimum altitude of the vector being this highest value.



The H-2 aux fuel transfer system is certainly not perfect. Until the system is improved, however, pilots must be aware of this deficiency and take their fuel limits into consideration. Here's one crew that didn't, and it almost cost them a helo.

When you gotta bingo, you gotta go!

TWO SH-2F helicopters were scheduled for night, touch-and-go landings aboard an aviation facility ship. Number 1 helo arrived overhead at 1800 after a 20-minute flight from a shore station. Number 2 helo launched from the ship.

Number 1 helicopter arrived with 600 pounds of fuel in the aux tank and 1450 pounds of fuel internally. Number 2 helicopter had about the same: 800 pounds in the aux and 1500 pounds internal.

About 1840, the helos reported 35 and 40 minutes respectively to splash. Since the ship was changing boilers, air ops informed the pilots they couldn't land to refuel for 5 to 10 minutes. Each flew an approach to the ship and was waved off. As it turned out, the change of boilers took 15 to 20 minutes, considerably more time than had been estimated. Moreover, due to a peculiarity in the H-2 fuel system design, it wasn't possible, while in the pattern with the gear down, for either to use aux fuel.

The stage was thus set for a rise in the pucker factor. Number 1 didn't raise his gear to pressurize his tank and use aux fuel because of the anticipated short time until landing and the lengthy time required to pressurize the tank. Number 2 did pick up his gear, pressurized the tank, and used some aux fuel. Number 1 was then cleared to land, but, as luck would have it, he wasn't able to refuel due to a problem with the fuel hose coupling.

A decision was made to launch No. 1 with 300 pounds of internal fuel to an air station 25 miles away. Number 2 landed aboard ship; No. 1 headed for the beach. Fortunately, no delays were encountered enroute because the helo had a dual-engine flameout 10 minutes after landing while awaiting fuel! (The flight time from the ship to the beach was insufficient to pressurize the tanks and use the 600 pounds aux fuel.)

The message endorser questioned the pilot's actions, the ship's procedures, and the peculiarities of the H-2 aux fuel design. Squadron pilots had been instructed to bingo, under similar circumstances, when 600 pounds of internal fuel is reached. The HAC didn't follow SOP.

It's easy to understand what went on in the pilot's mind. He *thought* the boiler shift would just be a momentary delay and he'd be able to land and refuel. He probably also *thought* a safe transit to the beach, with time to use aux fuel, could be made. However, it isn't easy to understand why the HAC of No. 1 decided to bingo after his unsuccessful attempt to refuel. Even a quick, rule-of-thumb guess would have indicated that he stood a good chance of having to ditch.

The endorser further brought out the necessity of aviation facility ships maintaining close coordination between air and ship functions which bear on the recovery of aircraft (e.g., shifting boilers with aircraft in the pattern is an unnecessary risk). Additionally, tower reports concerning fuel state need to be received and analyzed by ops and helo control watchstanders. It shouldn't have been necessary for both of the aircraft to land or divert at the same time.

Finally, the endorser reiterated the need to do something, right away, about the H-2 community carrying fuel in the aux tanks which can't be used. Fortunately, something is being done to solve the aux fuel transfer problems that just about did this crew in. Airframes Change 235 allows fuel transfer with the gear down. This fix will be issued in kit form starting immediately and can be installed on the organizational level. ◄

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Watch Your Sleeves. The pilot of an AV-8A was on a syllabus sortie practicing confined area landings. As the engine accelerated, the aircraft began to move off the landing zone pad. There was very little forward room (the pad was about 100 feet by 100 feet). When the *Harrier* eased off the matting, the pilot reselected hover stop and tripped limiters. He became airborne very close to trees bordering the landing zone and blew up copious amounts of mud and dirt. He continued to climb and, when clear of the zone, executed a landing as soon as possible to inspect for damage. There wasn't any. The culprit for this close call was his flight suit sleeve snagging the nozzle control lever as power was advanced.

This problem has arisen from time to time in the AV-8A community, but this incident was close to disaster. All pilots, particularly *Harrier* types, must ensure that flight gear will not interfere with the flight controls.

Good Show. An A-6A, piloted by LCDR Gary L. Forsberg, was returning to NAS Whidbey after a local bombing flight. During the flight of 1.7 hours, the speed had varied between 200-500 KIAS. Acceleration forces had been between .5 negative and 5.0 positive G. Suddenly, the stick locked in the lateral mode. Flaperon trim had no effect either. The aircraft began to roll right, approximately 10 degrees per second.

The aircrew declared an emergency. The pilot retarded throttles and countered the roll with full left rudder. Upon reaching 240 KIAS, the gear was lowered, and at 220 knots, flaps were lowered to the takeoff position. The stick remained *locked* throughout the dirtying-up movements, until the flaps reached the takeoff position – then it could be moved laterally. Even then, lots of pressure was needed to move it to the right.

LCDR Forsberg executed a 148-knot, straight-in approach to an uneventful flared landing. On deck, flaps and controls were cycled through many times, and the STAB AUG continued to disengage with a slight bump when the stick was moved right. Maintenance investigation revealed a dzus fastener jammed in the flaperon control linkage bellcrank.

APPROACH concurs in the CO's comments: "LCDR Forsberg is commended for his airmanship. His timely and proper action averted the possible loss of an aircraft."

Zapped a Pole. After turning off the duty runway, the pilot of a C-1 was instructed to park near the tower next to a civilian light aircraft. He taxied toward the designated area and remained close to a fence along the edge of the ramp to avoid blocking ramp traffic.

The pilot stopped well short of a yellow line painted on the ramp, well out from the fence but parallel to it. He judged his distance to a utility pole as satisfactory and started a slow, left, pivoting turn. The pole passed out of his view to starboard just before his wingtip hit the pole. He stopped immediately, inflicting very little damage to his wing, but the force with which he hit the pole was sufficient to knock it down.

The pilot didn't play it too smart. He allowed himself to be distracted by an approaching

vehicle, and he failed to put his crewman outside to assist in parking. Incidentally, he wasn't the first military pilot to knock the same pole down — three others had done it before. It kind of makes you wonder why the airport manager doesn't relocate the pole or, at the very least, stick some kind of warning in the aerodrome section of the FLIP.

Anyone going into Trumbull Airport should be aware of this trap.

Almost Dead. An RA-5C was chocked and chained for a hook check following a trap. Squadron maintenance personnel requested a Fly-2 petty officer to give the "hook down" signal to the pilot. The Fly-2 petty officer checked the area and gave the "hook down" signal. Simultaneously, another aircraft director attempted to cross under the *Vigilante* via a route directly beneath the tailhook. He realized his mistake once under the aircraft, started to back out, but by this time the hook had pinned him to the flight deck. An immediate "hook up" signal was given and the hook was raised. It had pinned the aircraft director for about 5 seconds.

The aircraft director violated established flight deck safety procedures, but not because he wasn't aware of them. He had 22 months' experience on the flight deck and was aware of the dangers inherent in tailhook areas. He also was aware that RA-5C aircraft routinely drop tailhooks for maintenance purposes after all traps.

The Fly-2 petty officer who gave the signal was about 5 feet from the port side of the fuselage and about 5 feet forward of the nose. The injured director crawled under the tail of the *Vigilante* from starboard to port, which placed him on the blind side of the aircraft from the Fly-2 petty officer. RA-5C nozzles have less than 3 feet of clearance, and the canoe forms a visual barrier which is even lower. This peculiarity of the *Vigilante* makes necessary a very deliberate visual scan of the tail area prior to signaling tailhook actuation. To see that the area is clear on the starboard side requires an even greater effort.

Several other people present were more aware of the dangerous conditions taking place than the Fly-2 petty officer, and it's to their credit that the pilot saw their frantic signals to raise the tailhook. The aircraft director suffered a minor soft-tissue injury to a shoulder and mild concussion. He was put on light duty for about 4 days — darn lucky for someone almost crushed to death!

Plane captains, aircraft directors, and anyone having control of aircraft on the flight deck *must be certain* in every case that any movement they direct can be accomplished without danger to other personnel and equipment. Fortunately, the injured man was wearing the proper flight deck gear. It probably prevented more serious injury.

Abort. The tower cleared the CAPC of an S-2G for a touch-and-go. Just after the *Stoof* touched down, the CAPC repositioned his flaps to two-thirds and added power for takeoff. The pilot attempted to rotate to the takeoff attitude but was unable to do so — even with the yoke as far aft as it would go. He aborted his takeoff at about 95 knots and returned to the line.

A postflight inspection was performed, and a leather glove was found draped over an elevator control cable, running through the torpedo bay. The glove was located next to a cable fairlead and appeared to have been partially pulled into the fairlead by the cable. No other discrepancies in the control system were found.

It is suspected that the glove was pulled into the fairlead by the control cable quick disconnect link and jammed the cable. Although the pilot felt he had full back yoke, it is doubtful that it went full aft. The glove was stiff with aircraft preservative of the type used on cables. There is a good possibility that the glove had been in the torpedo bay for a considerable length of time prior to this incident. It might have been left on one of the longerons during a routine inspection.

Tools alone are not the only causes of control cable FOD. Many times, rags and articles of clothing have been the culprit in restricting control cable action. It's just as important to account for personal items, such as gloves, as it is for tools. FOD consciousness must be a high priority program.

Simulated Instrument Hood

By LT James R. Porter
VT-31

I WAS explaining to a student naval aviator how he would not want to manhandle the aircraft in actual conditions as he had been doing on this clear, hot South Texas day. I could see by his apparent confusion that what I had termed rough manhandling represented firm, positive control to him. We were both frustrated that he had not achieved an "above average" in basic air work, and I had not made my point satisfactorily. One of my fellow flight instructors, LT Cutcher, who had civilian pilot time, suggested a possible solution to this problem. He said, "When I was learning to fly instruments from a civilian flight instructor, we used a hood and there was no question about the smooth techniques required to fly in actual instrument conditions. The simulated environment provided everything, including an occasional case of vertigo."

This started us thinking. He built an instrument hood out of cardboard and tried it out on his students for a week. Afterwards, we talked about the shortcomings of the cardboard hood, and I got together with another instructor, LT Dandalides. He built a mold from my design, and we made two prototypes out of plastic. We used the hoods on students for approximately 3 months in Flight III and studied the results. I found from talking to other instructors that students flying under the instrument hood demonstrated all the characteristics of flying in actual instrument weather conditions for the first time. Abrupt control movement resulted in unusual attitudes, students complained of vertigo, and initially, a general roughness characteristic of someone unaccustomed to flying in the clouds. After continued use (three to five hops), most students' performance smoothed out, and they would become proficient at flying with the vision-restricting device. Some students even asked to fly under the hood because they enjoyed the challenge.

The real worth of the hood became evident one day when the weather had gone down to 300 overcast, 2 miles visibility in fog, with winds gusting to 30 knots. I had an opportunity to fly two students in the same stage of training and with comparable flight grades. The only apparent difference was that one had five hops under the hood, the other had none. The student who had previously flown under the hood flew first. The gusty winds caused turbulence in the clouds, and this student did as well as I could normally expect. This was a GCA hop and all his GCAs resulted in touch-and-go's. At the completion of the hop, I switched students on deck and No. 2 student took off. As we entered the soup at 300 feet, it became obvious that his scan had not developed to the point where he could cope with the requirement at hand. He first got slow and nose-high. Overreacting to this condition, he pushed the nose over and let the right wing drop into 45-degree angle-of-bank. At about this time I took control, climbed to level-off altitude, and let the student fly straight and level until he could begin to fly safely. Number 2 student suffered from poor basic air work all afternoon, never fully recovering from the anxiety of this initial encounter with actual weather conditions. He was just not accustomed to functioning in an environment without external visual references. I feel No. 1 student had a definite advantage with the experience provided by having used a vision restricting device.

Photo 1 is a picture of my hood. It is easily made out of ¼-inch Plexiglas painted black. It attaches easily with velcro tape, costs almost nothing to make, and can be constructed of easily obtained items. It can be attached and removed quickly, plus its light weight enables it to be stored in the aircraft until needed.

I often think that if some of us seasoned fleet aviators had spent more time under the hood/bag, some of the initial apprehension of flight in actual instrument meteorological conditions might have been reduced.

Could it have made us a little more proficient when the chips were down and so were the ceilings? Every instrument training school I have ever heard of has used vision restricting devices for simulated instrument training. The FAA uses them on their check flights. Every community in the Navy officially uses vision restricting devices except the prop community. Can you honestly log simulated instrument time without some sort of vision restrictor? What do you think?

Our device may not be perfect, and our trial group may not have been statistically accurate. Nevertheless, common sense alone says that *some* vision restriction device is better than none. So, until more sophisticated devices can be developed or new aircraft procured, our instrument hood is suggested as one method of improved training. For further information or to procure a sample hood, contact COMTRAWING FOUR, NAS Corpus Christi, TX.

The Four Horsemen of the Apocalypse

By CDR A. F. Wells (MC)
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FOUR destroying angels (illness, boredom, fatigue, unfitness), unlike the four horsemen in the Book of Revelations, do not ride across the surface of the earth with fire and thunder, spreading war, disease, and famine beneath their hooves. They are, by contrast, quiet and insidious, like the knife of an assassin – and just as deadly. Any single entity is dangerous in its own right, but allied in combination they form a whole which is more than the sum of its parts. Time is on their side, and an individual's ability to combat them decreases the longer he attempts to do so.

Illness. The possible effects of illness on the abilities of a naval aviator defy enumeration. The most common cause of illness in Joe Average Aviator is a viral upper respiratory infection (a cold, the flu). Only an inconvenience on the ground, it's a deadly adversary in the air. A cold can cause exquisite, incapacitating pain during penetration. It can turn minor disorientation into uncontrollable vertigo. It can mess up an O_2 mask with all kinds of nasty stuff. The commonly associated vomiting and diarrhea, combined with ACM, high-G loading, G-suit squeeze, and the valsalva maneuver, suggest a scenario fascinating to contemplate. Misery caused by illness can distract a pilot so much that he'll finish the flight using his lower primitive brain circuits, reserving the higher cerebral centers for self pity. This gives him all the intellectual function of an educated clam.

Boredom. Lord, aren't we all familiar with this. This article may be a practical demonstration. Boredom causes impaired thought processes, childish emotional responses, decreased perception, and even hallucinations.

Essentially, one becomes irritable and prone to daydreams. Hallucinations, uncommon in multiplace aircraft, can easily happen when you're up there alone. Lindbergh had them. So do cross-country truckers. One sees things that are not there. There is also an interesting (and for the pilot, frightening) illusion called the breakoff phenomenon where one feels that he is no longer really part of the earth. This occurs during high-altitude, routine, boring flights. All of this is instantaneously cured by a near-miss.

Fatigue. Fatigue is an interesting subject, difficult to study and almost impossible to self-evaluate. It is seldom given the respect it deserves. A man who says he's too tired to work well is regarded as a nonhacker.* If he is speaking of gross motor work he may well be a nonhacker. If he, however, has a job requiring mental alertness and fine motor skills, he probably just understands the situation.

The first casualty in the fatigue onslaught is vigilance. This is closely followed by degradation of fine motor skills and a gradual but steady deterioration of judgment. A person may state that he feels tired but that his performance is still good, when to an outsider it's obvious that he is doing poorly. A curious situation occurs with fatigue. There are breaks or lapses where, for a discrete period of time, the person just "shuts off" – no sensory input, no mental integration, no motor output. That's right! For a short while he just isn't there. The more fatigue, the more frequently these lapses occur. A disembodied observer looking at a fatigued man in the aircraft would note the following:

- An increasing tendency to ignore instrument readings requiring action.
- Delayed responses to sensations. The response may be correct, but delayed.
- Time estimates are grossly wrong.
- The pilot demonstrates irritation, emotional instability, and diminished judgment.

One might draw the conclusion that fatigue is not an asset in aircraft operation.

Lack of Physical Fitness. Now we come to the last of our adversaries – that ole devil – lack of physical fitness. Fitness is given lip service in Uncle's Canoe Club, but with the exception of a few special units like UDT and SEALS, little action is actually taken to assure physical fitness. Here, the natural superiority of the naval aviator comes to fore. Most pilots and aircrew members are athletically inclined and keep themselves in fairly good shape. Some are even olympic grade competitors. However, most of us find ourselves in a constant struggle to remain fit in spite of the multiple little things that continue to keep us off the track and away from the gym.

Lack of physical fitness decreases G tolerance. It makes the jet aircrew more susceptible to ejection injury. It makes a downed flyer more vulnerable to capture in a combat situation, or death in a survival situation. It decreases stamina, increases fatigue, and can make you more susceptible to decompression sickness (bends). The typical pilot's self image of a world conquering barbarian diminishes, and the little Wave ensigns no longer look at you with lust in their eyes (a sobering thought for fighter pilots).

What to Do. The only consistently effective way to combat these four enemies is to nullify them with rest, psychic recharging, and good health and physical fitness. When this isn't possible, stay on the ground.

Fatigue is cured by rest with adequate hours of uninterrupted sleep. Try a little less booming on weekends. If the baby keeps you awake all night, make up an imaginative snivel the next day. (Say you have diarrhea; everybody respects that, and nobody will question you closely or demand proof.)

Boredom is a difficult problem. How can you make watching a radar screen, hour after hour, exciting? One way is to miss detection of an enemy aircraft. This is a sure cure for boredom but often introduces other problems like airframe buffet and pilot-induced escape system deployment. The best advice I can give is to perform all of your aircrew tasks with the highest degree of professionalism and care. Maintain a conscious commitment to the task at hand. Don't settle back and let events stream by at the periphery of your consciousness. Be aware of boredom and what it can do.

If you're sick, don't fly. Ask yourself, "If I feel marginal now, how will I feel wearing a wet suit, hot *Nomex* flight suit, helmet, O_2 mask, torso harness, and sitting in an inverted fish bowl on a very hard seat?" If you're sick, go see your flight surgeon. If he's busy with dependent mothers-in-law, go see a corpsman. Or go to a movie; go visit momma for some chicken soup; go anywhere, but don't go to the aircraft.

A time should be set aside every 2 days for a program of physical fitness. Barring illness, of course, war, or national disaster, this program should be adhered to. Running and swimming are good; tennis and weight lifting are mediocre; golf is almost worthless.

All life is a gamble, but in aviation, if you recognize these enemies, avoid them like the bubonic plague, and keep yourself in 4.0 condition, you'll load the odds heavily in your favor. Ignore these enemies and you're playing a losing game.

* The Medical Department, in their intern and residency program, is the worst transgressor in this regard, routinely driving some of their doctors to the point of mental disfunction.

CV Safety Problems:

ALTHOUGH it wasn't intended as a muckraking expose, CDR H. A. (Al) Petrich's article on "CV Safety Organization – Reality or Lip Service?" (JAN '76 APPROACH) clearly demonstrates the dilemma that has haunted all commanding officers for many years. How can he best meet commitments and engender a "can-do" attitude given the myriad of problems and complexities found in a shipboard safety program. The problem is not hopeless, however. The steps we have taken aboard AMERICA are typical of what can be done to improve a ship's safety organization and thus its safety effectiveness. Take the most urgent problem, personnel manning, as an example.

Each talented and experienced petty officer is deemed critical and sorely needed almost before he reaches his new command, and the assignment of such a man to a ship's safety organization (a department which many consider to be *ad hoc* at best) wrings screams of anguish from other heads of departments and creates animosity by the ton. This entire attitude may be likened to the perennial problem of people assigned to Quality Assurance within a squadron, where certain maintenance officers categorically state that a particular petty officer cannot possibly be transferred from a work center to QA because "He is too good," or "He's the only man who can perform certain critical functions." The inference rapidly becomes quite obvious; the man is simply too valuable to be placed in a job such as Quality Assurance. Squadrons have long since realized the folly of this logic, but somehow this understanding is not typically carried over to shipboard safety.

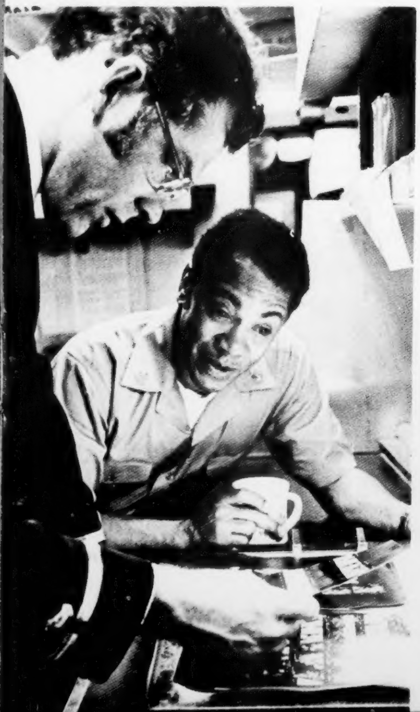
Is the problem one of pure administrative malaise? Certainly not; nor can the responsibility for many of the problems pointed out by CDR Petrich be shunted off to the type commander. We're all overly fond of telling ourselves that "a staff either acts or reacts" and

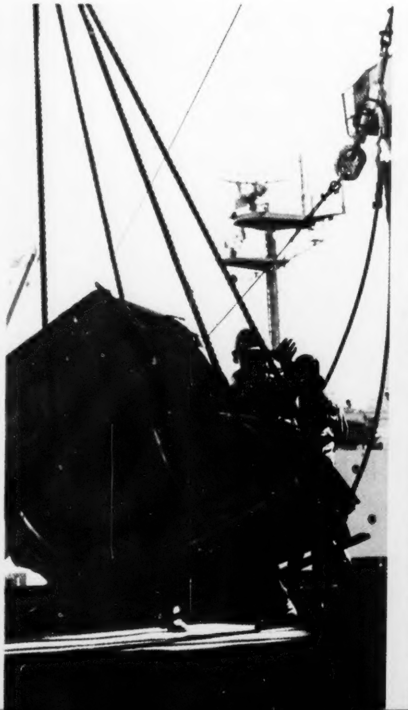
AMERICA's Approach

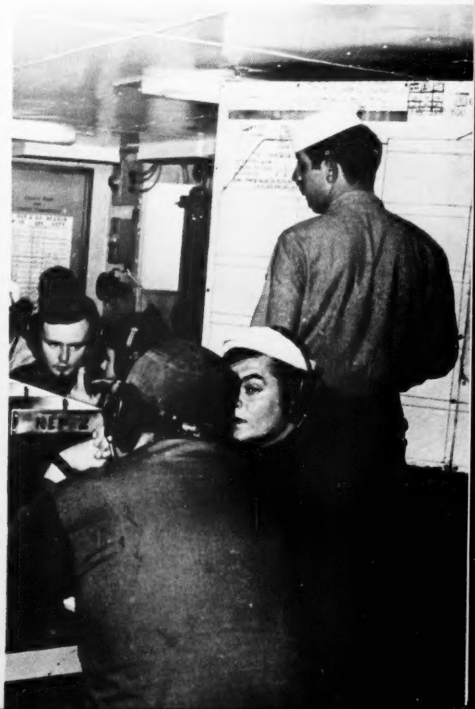
By CDR S. P. Dunlap
USS AMERICA

rationalizing our troubles away without facing up to our responsibilities. No naval organization will be properly manned unless approved billets exist, but why should the responsibility for initiating a 1000/4-request fall to the type commander? All it takes at any level of command are proper forms with the proper justification to initiate action. Once the safety officer places himself in the position of going to the executive officer with his hat in his hand each time he needs a man, both the commanding officer and the executive officer must share the problem as well as the responsibility, but not the type commander.

Another major shortcoming in CV safety is administration and standardization. What is obviously needed to resolve at least a portion of the CV Safety Department problems is a central body to act as a submission point for all problems, as well as recommended solutions. Solutions considered appropriate could then be incorporated into a uniform and standardized set of rules. I'm not suggesting an additional manual or NATOPS; they already exist in sufficient numbers to strangle an ox. What we really need, however, is a compilation of that data used by a CV Safety Department with a simultaneous reduction in the volume of paperwork we sort through daily. This single act would go far toward the standardization of the safety efforts and policies of every carrier. Naturally, billets would have to be standardized as well, with an







eye toward the complete deletion of all spurious TAD assignments.

Where must the responsibility go for compilation, correlation, and consolidation of the various notices, instructions, directives, manuals, etc.? I believe that the Naval Safety Center is in the best position to compile recommendations on the standardization of CV Safety Departments, once a talented and motivated cadre of 11XX/13XX personnel is brought together for this specific purpose. One limiting factor under the existing arrangement is that the Safety Center CV Safety billet has traditionally been manned by an 11XX officer who, while knowledgeable in the areas of damage control and industrial shipboard safety, has obvious limitations insofar as aviation is concerned. Since the CV safety officer is expected to be active in all areas of aircraft carrier safety, is it unreasonable to expect his Safety Center counterpart to be less?

Perhaps the greatest administrative shortcoming in a CV safety program is the lack of a report comparable to aviation's incident report. The aviation wing or squadron safety officer has always prided himself on his ability to point out potential problem areas through the Incident Report. This simple message places valuable data in the hands of all users in a rapid and efficient manner. Oddly enough, there is no shipboard equivalent of this report other than a multipage form which is completed and then mailed out, not to Fleet users but to the TYCOM and the Safety Center. This procedure is not only cumbersome, but also may actually augment, because of delays, those same problems which each safety officer attempts to solve. Somehow we must consolidate and standardize all reports of safety related mishaps, regardless of the color of the user's shoe, so that valuable information may be rapidly placed in the hands of all users, rather than in a data bank for future reference. To do less is to make the shipboard safety officer an accident reporter rather than a preventer.

In summary, the simple fact of the matter is that CV safety must be treated just as corporate safety if the

desired results are to be achieved. In implementing this action, we must standardize the following areas:

- Billet structure.
- Quality of personnel.
- Education of personnel.
- Primary duties of personnel.
- Equipment to carry out the program.

Here is how AMERICA has approached these areas.

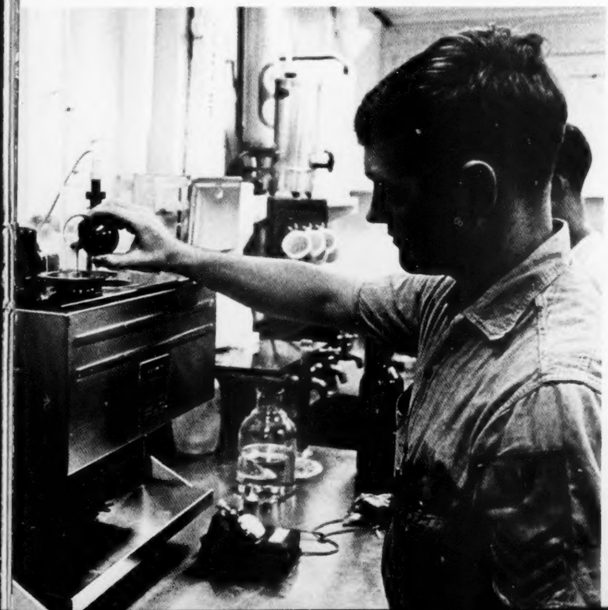
USS AMERICA has obtained permanent billets for the Safety Department through the medium of the 1000/4. These billets have now been allocated to each Atlantic Fleet carrier by COMNAVAIRLANT action. While the billets required by one ship may not be completely suitable for another, the pure mechanics of swapping should be left to the individual unit commander's discretion.

Quality of personnel may only be regulated through interview and observation. Any petty officer sent to the Safety Department must be thoroughly familiar with his ship prior to assignment if he's to be properly used. The absolute right of acceptance must rest with the safety officer if the department is to keep from becoming a personnel "dump." TAD assignments must either be avoided or accepted under very stringent guidelines.

Once high quality personnel are obtained, how do we train them to become professional safety experts? Formal education is, of course, a major step. Numerous excellent schools exist which may be used to great advantage by all Safety Department personnel. However, the present fiscal climate coupled with crowded operating schedules normally precludes use of all but those schools available locally. This area is one where the TYCOM may be of great assistance in compiling a list of all safety related schools, as well as correspondence courses offered by various organizations.

I addressed a portion of our education gap by sending all members of AMERICA's Safety Department through a night syllabus on industrial safety offered by a local college, and we will continue to use local service schools in the Norfolk area. Certainly, this is not the optimum solution; however, it is obviously far better than doing nothing. COMNAVAIRLANT is presently compiling a complete listing of all safety related syllabi for use by Fleet units and will make information readily available to anyone desiring it.

Cross-training is another technique we use to improve our safety expertise. Primary duties of Safety Department personnel must, of course, be assigned in accordance with their expertise. Thus, duties on the flight deck should be left to aviation Group IX personnel, while damage control equipment may be best inspected by a hull technician. However, collateral duties afford ample room for cross-training, and this must take place if all vital areas are to be covered on a regular basis. AMERICA has specified areas to be inspected, the frequency of that inspection, and the criteria to be used. The system is implemented by teams, with results and followup inspections reported to the CO and cognizant personnel. The key to this system is full standardization of inspections. As a result, cross-training of inspectors is simplified, and the reports are fully credible.



No program, no matter how well designed, can function without the proper tools. In working the flight deck during air operations or VERTREP, at least one member of AMERICA's Safety Department observes operations and uses a "mouse," to be fully responsive to any problems. An allowance for these expensive radios presently exists for all CVs and is normally sufficient to satisfy the needs of the Air Department but not necessarily the Safety Department. To guarantee us the availability of these valuable aids, I requested an allowance change and cited the justification. Approval was rapid, and COMNAVAIRLANT expects to augment all Atlantic Fleet carrier allowances shortly.

There is far more to be said about a ship's safety program, but to me one point is obvious: self-indulgence is a luxury none of us can afford, while self-help does get results. Numerous excellent services exist which can augment our programs, and all may be exploited once their availability is known. The construction of a superior CV Safety Department is a frustrating job, but then the entire battle of safety versus human action is frustrating to a major degree.

Despite the difficulties which exist in the current ship's Safety Department concept, it is patently obvious that we are operating with fewer personnel injuries and deaths than we did 10 years ago. I recall my early years aboard a specific ship where it was not unusual to learn of a serious injury or death almost weekly. The only pure statistic I can draw upon to compare operational safety improvement is in the aircraft accident rate. The Navy has improved tremendously. I can't compare industrial or driving accidents. In fact, lack of reporting of such accidents in past years may nullify a valid statistical comparison. I do know that AMERICA completed its recent overhaul without military lost time due to industrial mishaps, and I can only conclude that we are headed in the right direction toward improvement in safe operations.

Perhaps in the light of present and predicted Fleet petty officer manning, each CO must finally ask the question, "Is a Safety Department what I really need (want)?" If the answer is "Yes," then it must be actively supported at all levels, by more than a few pieces of paper – to do less is to take yet another step backwards into history.

Naval Safety Center closeout reports on aircraft accidents usually contain conclusions that are seen again and again. "Pilot error," "Maintenance was a causal factor," and "Supervisory errors were evident" are just a few of the more commonplace conclusions made by NAVSAFECEN. Well, the worm has turned! Here, from VT-31, is an *expose* that will rock the safety world. The AMB (Aircraft Mishap Board) has concluded . . .

A cle
safety cen

FROM: TRARON THREE ONE, CORPUS CHRISTI, TX

TO: NAVSAFECEN, NORFOLK, VA

INFO: CNATRA, CORPUS CHRISTI, TX
CNET, PNCLA, FL
COMTRAWINGFOUR, CORPUS CHRISTI, TX
TRARON TWO EIGHT, CORPUS CHRISTI, TX
COMTRAWINGONE, MERIDIAN, MS
COMTRAWINGTWO, KINGSVILLE, TX
COMTRAWINGTHREE, BEEVILLE, TX

BT

UNCLAS E F T O //N03750//

SAFETY UR/1975 CNO SAFETY AWARD

A. OPNAVINST 3750.6K

1. VT-31, UR SER 10111

2. HANGAR 47, TRAINING SQUADRON THIRTY-ONE, NAS CORPUS CHRISTI, TX

3. KELLEY, DANIEL W., JR. (PAO), LT, USN, 016-40-5273/1310

4. TBA-5294-000

5. FOXTROT/GOLF

6. NONE

7. DURING PREFLIGHT OF THE SHIPPING CONTAINER RECEIVED FROM NAVSAFECEN, A RATTLING NOISE WAS HEARD EMANATING FROM WITHIN. AFTER OPENING THE CONTAINER AND REMOVING THE CONTENTS (THE 1975 CNO SAFETY AWARD), SUDDENLY, AND WITHOUT WARNING, THE PLAQUE DEPARTED FROM THE FRAMED BACKGROUND TO WHICH IT HAD BEEN PRESUMABLY ATTACHED AND BEGAN A VIOLENT ROLL TO THE RIGHT. AS THE FRAME PASSED THROUGH 60 DEGREES ANGLE-OF-BANK AND AN ATTITUDE OF APPROXIMATELY 70 DEGREES NOSE-HIGH, THE AWARD DROPPED SHARPLY TO AN EXTREME NOSE-LOW ATTITUDE AND ENTERED A SPIN TO THE RIGHT. THE INADVERTENT SPIN WAS INITIATED AT 4 FEET ADL (ABOVE DECK LEVEL). THE PILOT INITIATED RECOVERY IN ACCORDANCE WITH PROCEDURES PRESCRIBED IN NATOPS AND SUCCESSFUL RECOVERY WAS COMPLETED AT 2 FEET ADL.

ear case of nter error.

By LT Dan Kelley
VT-31

8. CNO SAFETY AWARD PLAQUE, SER NO N/A/WUC N/A/MFG 3/P/N N/A/CONT NO UNK.

A. N/A
B. N/A
C. N/A

9. N/A

10. N/A

11. POSTFLIGHT INSPECTION REVEALED THAT THE UPPER AND LOWER SCREW AND WASHER ASSEMBLIES, INTENDED TO FASTEN THE BRONZE-LADEN, MAHOGANY PLAQUE TO ITS FRAME-ENCASED BACKGROUND, WERE NOT SECURED. THE PLAQUE HAD BEEN APPARENTLY TORN LOOSE WITH A CONSIDERABLE AMOUNT OF FORCE PRIOR TO PACKING.

12. NONE

13. NO

14. NO

15. REPAIRED, CNATRA, CORPUS CHRISTI, TX

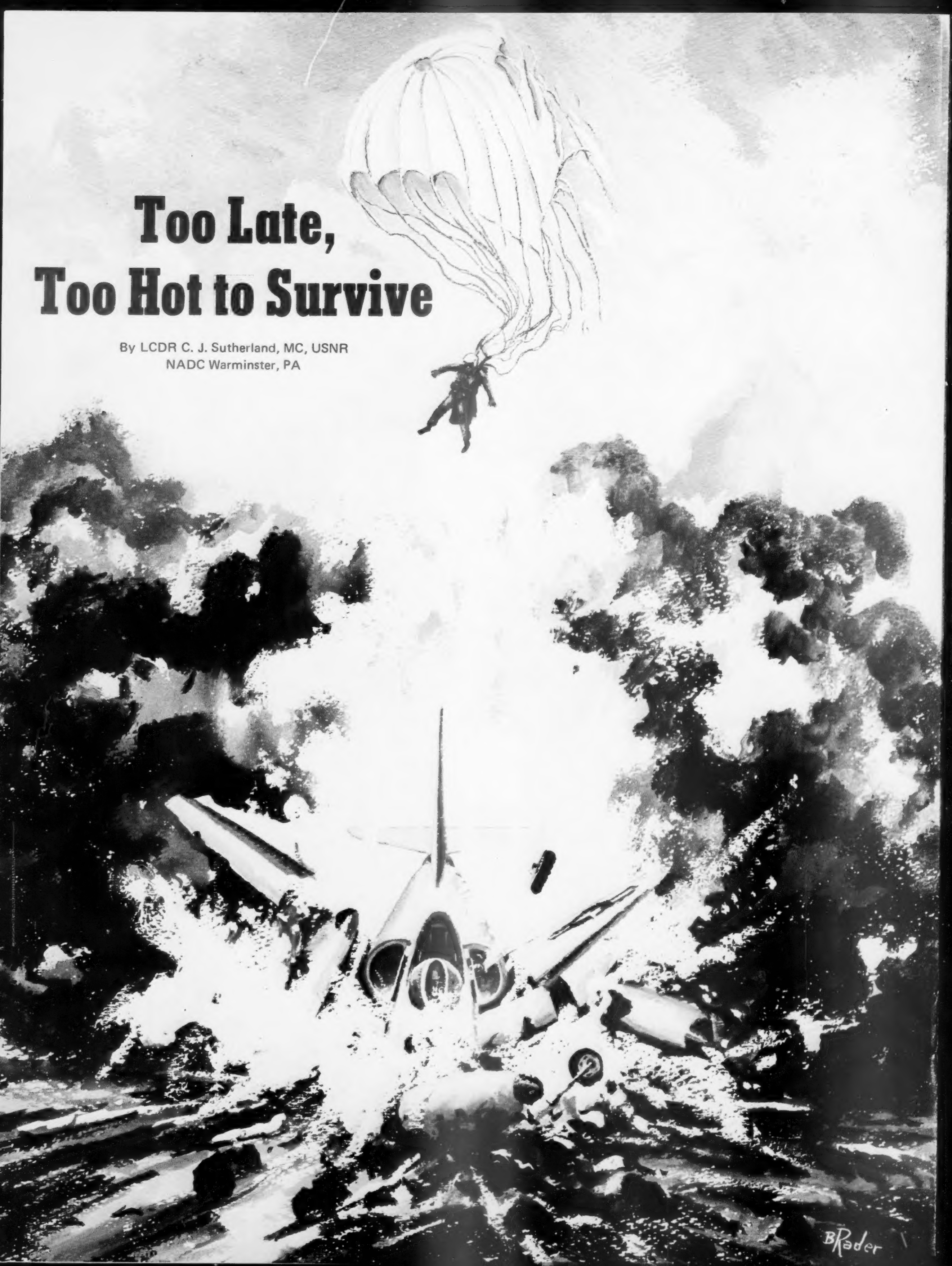
16. LCDR W. A. JOHNSON, VT-31, AVN 861-2018, HOME (512) 937-3274

17. A. N/A
B. N/A
C. N/A
D. ONLY QUICK REFLEX ACTION ON THE PART OF THE PILOT, AS WELL AS STRICT ADHERENCE TO PROCEDURES PRESCRIBED IN NATOPS PREVENTED A POTENTIALLY EMBARRASSING SITUATION FROM DEVELOPING. THE CONSEQUENCES OF THIS INCIDENT, SHOULD IT HAVE OCCURRED DURING THE CEREMONY FOR THE PRESENTATION OF THE AWARD TO TRARON 31 BY THE DCNO (AIR WARFARE), CAN ONLY BE IMAGINED. THIS INCIDENT COULD HAVE BEEN PREVENTED BY INCREASED SUPERVISION, GREATER ATTENTION TO DETAIL, AVOIDING COMPLACENCY, AND FOLLOWING ESTABLISHED PROCEDURES. IT IS RECOMMENDED THAT ALL HANDS AT NAVSAFECEN BE REBRIEFED ABOUT THIS HAZARD.

BT

Too Late, Too Hot to Survive

By LCDR C. J. Sutherland, MC, USNR
NADC Warminster, PA



Some months ago, a fatal accident occurred and I, as duty flight surgeon, shared the responsibility of investigating. All accidents are unfortunate, but this one was particularly so.

AFTER experiencing catastrophic engine failure shortly after takeoff, the pilot, a combat-experienced aviator, attempted to avoid a populated local area and bring his A-4 *Skyhawk* in for an emergency arrested landing. The aircraft crashed on government property about 1000 feet short of the runway. A few seconds before the *Skyhawk* impacted the ground, the pilot ejected. At this time he was well within his ejection envelope. And yet, the accident investigation showed that the pilot had no chance of surviving his ejection under the circumstances in which he ejected.

This determination was possible due to the fortuitous combination of three circumstances. First, a special flight recorder was installed in the aircraft as a part of its R&D mission. This recorder obtained virtually all flight parameters at least every 10 seconds and was retrieved from the wreckage. Second, a key component of the ejection seat system was located. (The location of the part, combined with data from the flight recorder, made possible identification of the time and place at which ejection was initiated.) Last, a computer program was available which was capable of determining the pilot's trajectory throughout the ejection sequence, having been given the pilot's position, the aircraft's speed, and the particular seat used in the ejection.

Under the conditions of ejection – straight and level, about 100 feet AGL, just about stall speed – the pilot was carried to a point about 100 feet over the fireball, where his deployed chute disintegrated from the heat. The pilot died instantly from massive internal injuries resulting from ground impact.

The "zero-zero" seat worked as advertised. However, no claim is made for its ability to perform beyond the envelope. Several of the exceptions are well known to jet pilots, such as high-speed ejections and high sink rate/low altitude/unfavorable attitude ejections.

In this case, the pilot apparently decided to stay with the aircraft as long as possible. He had enough confidence in the ejection seat system to punch out, if necessary, just before the aircraft stopped flying. It was the wrong decision. Analysis of the accident clearly demonstrated that if the pilot had initiated ejection 1 second earlier, he would have descended comfortably into a flat cornfield.

This case is not an isolated one. Ejecting into the fireball is something nearly all jet pilots have heard about. In fact, pilots have been run over by their aircraft. The point is that conditions exist which are extremely difficult to determine beforehand due to the variability of aircraft, seat designs, and flight parameters.

The purpose of accident investigation is to obtain valuable information and reduce the loss of human lives and aircraft. Since plans for more sophisticated ejection systems are essentially still on the drawing boards, it's my opinion that information about the current generation of "zero-zero" ejection seat systems should be widely disseminated.

In general, the conditions under which ejecting into the fireball is likely to occur are: *low altitude, slow speed,* and *stable flight.*

The Weekly Summary, No. 30-74, reported a case of a fatal ejection due to parachuting into a fireball. Newer escape systems with faster opening chutes make it possible to eject (usually safely) at lower altitudes. The median ejection altitude was 1500 feet in 1970. It decreased to 300 feet in 1973, then rose to 750 feet in 1974, and was 1500 feet in 1975. The faster-opening chute means that you're getting a full chute closer to the bird you just left. At extremely low altitudes, this can put the pilot right over the fire/explosion.

The Weekly Summary, No. 34-74, reported a study of ejections which occurred at less than 300 feet. It pointed out that the best chance for survival was to eject as soon as possible – **without delay**! *In addition to this fatality, two other fatalities occurred when the ejectees drifted into aircraft fires after chute deployment.*

The NAVSAFECEN publication, Emergency Airborne Escape Summary for CY-74, reiterates the above, "DELAY in initiation of ejection was . . . a major fatality factor, occurring in 7 of 16 fatal ejections . . . One fatality occurred as a result of passing through the aircraft fireball with a fully deployed chute . . . In another case, ejection was delayed until the aircraft went over a seawall and tilted nosedown at the moment of ejection, causing the chute to become entangled with the fuselage as the aircraft flipped inverted. It must be remembered that today's ejection systems are designed to put the man under the chute faster, and a full chute will usually be obtained in proximity to the aircraft impact point if ejection is initiated at an extremely low altitude. This lower ejection capability has saved many lives, but it also can and has cost some lives. It does not pay to wait until the last possible second to eject when the situation is obviously irreversible." ◄

Here's a copy of a squadron memorandum to all flightcrews written about 3 years ago aboard USS INDEPENDENCE. I feel that the concept of a good carrier aviator hasn't changed nor is the idea limited to *Phantom* crews.

What's a good carrier aviator?

By LCDR Michael N. Matton, USN
VF-101

AS squadron LSO and resident educator on the expertise of carrier landings, I submit the following as food for thought for *Phantom* crews. The F-4 is not the toughest aircraft to bring aboard a carrier, nor is it the easiest. Every aircraft has its own inherent qualities, deficiencies, and idiosyncrasies. The F-4 comes aboard ship as fast as any aircraft does and probably as fast as any ever will. This high approach speed means we must accept a higher closure rate and a higher sink rate than our slower *Buf* and *Sluf* friends.

To help the *Phantom* pilots, McDonnell designed a very speed-stable aircraft. This is an extreme advantage. This quality gets abandoned by many of us when we drop the nose or pull back on the pole as we cross the butt of the boat. It's very easy to ask someone not to do such dastardly deeds as these, just as it's easy to tell someone not to spot the deck. But both of these techniques we all use occasionally and will probably continue to use as we perform our tailhooker's job. These are natural, although not necessarily favorable tendencies, and are caused by some dynamic situation in the final phase of the approach. The nose is moved when there's an excess or a deficiency of power at the ramp. Deck spotting is caused when lineup corrections are needed or anticipated. (Some of us think we have to look at lineup more than others.)

The technical side of carrier operations could be discussed at great length, but instead I'd like to mention the nebulous, intangible side of carrier operations. I consider landing and taking off from ships at sea to be the most exacting, demanding, and challenging job available. It is exacting because of the dynamics involved, demanding because of the physical and mental strains, and challenging because it is never truly mastered. I don't believe I'll ever lose the satisfaction that I get from operating from a carrier, and, therefore, the desire will always be there to do it again, although the desire is usually directly proportional to the

intensity of the sun. This desire is only one facet of a good carrier aviator. I have decided what a good carrier aviator is. Whether or not this decision is valid is for you to decide.

My concept of a good carrier aviator is not a commander who flies *OK 3's* 9 out of 10 times. It's not the JO who does clearing turns 50 feet down the stroke. It's not the second tour pilot who tells the air boss over the radio what his directors are doing wrong. Nor is it the aviator who breaks at the island and handles an 8-second groove with finesse. Instead, it is anyone who blends talent, experience, expertise, knowledge, horse sense, a great deal of awareness, and professionalism into the entire environment of carrier operations.

The good aviator is totally aware of his job from brief until tripping over the knee-knocker coming back into the readyroom after the flight. In particular, he's cautious but expeditious during his flight deck work and keeps his backseater informed. He takes his shots and clears properly – staying at the correct altitude. He flies his mission as briefed, uses his fuel the very best he can, and shows his wingman or leader his best stuff. He returns to the ship on time; stays acutely aware of the pattern, his fuel, his entry; and usually flies a good, safe pass. It may not have been OK, but, if not, he knows why it wasn't. During the entire flight, he exercises a great deal of patience. In summary, the good carrier aviator is the one who blends all the qualities mentioned and becomes what I think of as a savvy professional. ◄

FOR ASO EYES ONLY

THE following questionnaire was submitted by Capt J. L. Cross, USMC, the ASO for VMFA-323, MCAS El Toro. It was presented to the squadron aircrews during a safety standdown. Answers, solicited without identification, were compiled and the results were discussed at a later AOM. A lengthy discussion about the hazards uncovered and what could be done to overcome them proved to be very productive.

Complacency Questionnaire

What are the published GCA minimums at Homeplate (MSL)?

Have you ever busted minimums anywhere to land?

Have you ever flown with a hangover? Will you do it again?

Have you ever flown with a cold? Will you do it again?

Have you ever flown with less than 4 hours sleep? Will you do it again?

Have you ever flown while under medication? Will you do it again?

Have you ever flown undernourished? Will you do it again?

What is your present physical condition?

How often do you work out?

Have you ever made or attempted an unintentional no-flap takeoff?

Have you ever taken off with seat pins in place?

How often do you use the penetration checklist?

Have you ever failed to report an overstress?

Have you ever taken off with a known downing discrepancy?

Have you ever failed to report a postflight discrepancy because you knew aircraft availability was critical and you figured "it wasn't that bad"?

Have you ever failed to declare minimum/emergency fuel when you should have?

How often do you review emergency procedures, other than on-the-spot requirements such as flight schedule entries, quizzes, etc.?

How often do you read the *WEEKLY SUMMARY?*

Are you satisfied that your knowledge is adequate to handle your aircraft under *any* conditions?

What do you think the chances are that you'll ever be involved in a major aircraft accident?

If married, do you carry any life insurance other than that provided by the service?

ASOs, if you spring this on your flightcrews it will allow them to do some soul-searching and possibly stimulate a lively discussion.

The "A" Sheet:

Reflection on Readiness

By LCDR A. K. Jenkins, USN
PATWING 11

PART A

PREFLIGHT, ACCEPTANCE, AND PERSONNEL RECORD

AIRCRAFT SERIAL NO. (BUNO)	TYPE/MODEL/SERIES	REPORTING CUSTODIAN	OXYGEN	FUEL GRADE	FUEL QUAN.	OIL GRADE	1	2	3	4	DATE

ORDNANCE/SPECIAL EQUIPMENT/LIMITATIONS/REMARKS

I HAVE PERSONALLY INSPECTED THIS AIRCRAFT IN ACCORDANCE WITH INSTRUCTIONS CONTAINED IN THIS FORM. ANY DISCREPANCIES NOTED HAVE BEEN ENTERED ON THIS FORM.

RANK/RATE	SIGNATURE OF PLANE CAPTAIN

I HAVE INSPECTED THE LAST DISCREPANCY REPORTS, INSURED PROPER FILING OF WEIGHT & BALANCE DATA, AND ACCEPT THIS AIRCRAFT FOR FLIGHT.

RANK	SIGNATURE OF PILOT IN COMMAND:

ORD

IF you ask aviation personnel about OPNAV 3760/2C, they would probably stare at you in confusion and send you to the administrative office for guidance. On the other hand, if you asked them about a yellow sheet, they would probably give you a detailed rundown on its functions.

Whether you call it OPNAV form 3760/2C or a yellow sheet makes little difference. However, how you perceive its use, does.

Recent incidents in the aviation community have brought me to the conclusion that Part A of the yellow sheet is seldom being completed with any serious reflection about the event. In other words, Part A is being completed and signed without the individual being aware of the real significance of what he is signing.

With this in mind, I have taken a close look at the definitions and purposes of Part A as defined in OPNAVINST 3710.7H and found some pretty stirring terminology. In an attempt to emphasize the seriousness of A sheet terminology and the appropriate individual's signature, I've repeated below applicable sections of OPNAV 3710, with italics for emphasis.

Part A of OPNAV form 3760/2C provides for: *certification* by maintenance personnel as to the *readiness of the aircraft for flight,* the *pilot's acceptance* of the aircraft in its existing condition, and (on the reverse) a list of *all personnel aboard* not listed on the front and reverse of Part D or on any other list (manifest) available to operations.

The limitations/remarks section is available to inform the pilot of *uncorrected discrepancies* or *unique characteristics of this particular aircraft.* These items do not preclude its flight, but they do *caution the pilot* or *limit mission capabilities.*

The ordnance/special equipment section is the area where the ordnance inspector should put his *signature certifying* that the ordnance is loaded and armed correctly.

Last, but by no means least, the pilot in command shall complete the acceptance section of Part A and list all personnel aboard on the back of Part A. By his signature on Part A, the pilot in command *assumes full responsibility* for the safe operation of the aircraft and the safety of everyone aboard.

When viewed in this perspective, the italicized intentions of Part A take on some very real and serious significance – especially when left behind as an aircraft flight record.

At this point it should be fairly apparent that the conscientious completion of Part A of the yellow sheet reflects both crew and aircraft readiness for flight.

The maintenanceman, flight engineer, ordnanceman, and pilot who affix their signatures to Part A of the yellow sheet should first take a moment to reflect upon the meaning that this seemingly insignificant action conveys. They should realize that Part A, when signed, probably reflects whether or not the squadron, aircraft, and crew are prepared to safely perform the assigned mission.

Is *your* A sheet a reflection of *your* readiness and professionalism?


MARINES
B Rader

Airborne cross-country flights in the A-4 are fun; cross-country landing rollouts in the A-4 could spoil your whole day.

A-4 Spoilers

AN A-4M configured with two 300-gallon external fuel tanks was in the FMLP pattern and was the third aircraft to execute a drag chute full stop landing. After touchdown, the MLG tread marks showed that the aircraft gradually drifted off the right side of the runway, across a closed runway, struck a runway marker with the port droptank, and came to rest about 22 feet off the prepared surface in soft dirt. It was tilted up on its starboard side with the weight of the aircraft distributed between the starboard MLG and starboard droptank. The starboard wingtip and probe were touching the ground but not supporting any weight.

The pilot shut down the engine, opened the canopy, and climbed out uninjured. Ground personnel used light water to subdue residual smoke.

The LSO had advised all pilots in the pattern to carry a low ball for final drag chute landings. He commented, "Number 12 made a normal approach with touchdown a little short to make more runway available for landing rollout. The aircraft was on speed at touchdown. Rollout started normally with my attention directed to a good chute."

Qualified observers noted unequal strut extension during previous touch-and-go landings of the aircraft. The LSO noted the right strut unusually depressed on rollout, even with proper crosswind corrections applied.

Investigation disclosed 2¼ inches difference in strut extension. The pilot had not noticed any discrepancy on taxi out, nor was any other material discrepancy revealed.

The pilot's crosswind landing technique was questioned. He applied proper flight controls (aileron into the wind) but the spoiler switch was found off. He remembered arming the switch downwind, but dearmed it when he decided he had enough fuel for another touch-and-go. The LSO, however, directed a full stop when the pilot called the ball.

Maintenance also was pinged when the mishap board found that the aircraft had been released for flight with the NWS (nosewheel steering) down. The system had been electrically and hydraulically deactivated. Even if NWS had been available, the aircraft might still have left the runway due to the speeds involved. However, with NWS it is possible that the pilot could have countered the drift and stayed on the duty.

Damages sustained in the incident were minimal. A wing pylon attachment fitting was cracked, the Aero-20A suspension rack and locking hooks were sprung, the doubler beneath the attachment fittings was cracked, some skin was torn, the Aero-1D fuel tank was buckled, and about 15 rivets on the port MLG door were popped. X-rays were completed by the IMA in search of other damage, but they were negative.

The CO in his endorsement made several comments which will be of interest to most A-4 pilots.

- An accurate determination of the crosswind couldn't be made. Aerology officially recorded 2 knots, but the tower had been reporting 13-14 knots to the two pilots who landed before the incident occurred. Observation of the midfield windsock showed less than 10 knots when the *Skyhawk* headed "cross-country."

- The pilot's failure to arm the spoilers was attributed to that old bugaboo – habit pattern interruption.

- A very important fact of life in the A-4 community is the pilots' general lack of experience with no-spoiler landings. Oldtimers who have experienced the terrors of crosswind drift in spoilerless *Skyhawks* do not have to be reminded to check spoilers up immediately after landing. Since incorporation of spoilers on A-4s in 1966, a generation of young pilots have appeared who have always flown spoiler-equipped aircraft and are unaware of the great increase in stopping distances and the crosswind dangers produced by a failure to use spoilers.

- Statements by recent graduates of the Training Command reveal that spoilerless landings, minimum-distance landings, and crosswind landing techniques are often omitted from training syllabi or covered only by briefings.

- Squadron training FAM flights have been changed and now require new pilots to perform no-spoiler and minimum distance landings under controlled conditions. Also, squadron SOP has been established to include armed spoilers during all SATS operations.

The CH-46D was damaged as follows: one aft blade had two holes punched in it, the RH stubwing had a 17 x 6-inch hole in the skin, and three intercostals and one rib were damaged on the leading edge of the RH stubwing. The helicopter missed strike damage by the thinnest of margins. All this because the HAC used . . .

THE HAC, PUI (pilot under instruction), crew chief, and a crewmember in training took off in VMC on a NATOPS check flight. The aircraft had a full internal range extension tank installed which weighed about 2000 pounds. Their PMS (power management system) was inoperative.

Before takeoff the HAC's preflight brief was extensive and detailed – it even included an oral exam. The flight would remain in the local traffic pattern to accomplish normal landings and takeoffs, SAS-off work, simulated single-engine emergencies, and emergency throttle work. After completing these phases, they would depart the pattern to proceed to an outlying CAL site for the PUI's operational evaluation. The PUI, after satisfying the HAC with his answers to the oral exam, then briefed the crew.

The PUI, in the right seat, called for and completed all checklists. They took off and practiced for about 30 minutes in the pattern. The HAC introduced the first emergency by pulling the No. 1 engine condition curcuit breaker. He notified the PUI that the next maneuver would be a simulated single-engine emergency followed by a practice single-engine approach and landing.

The PUI indicated he was ready. They were at 300 feet and climbing on the downwind leg. The HAC pulled both ECLs (engine condition levers) to START which caused a simulated failure of No. 2 engine. (Number 1 engine remained in the condition which existed when No. 1 circuit breaker was pulled.) The PUI lowered his collective to maintain N_r and began talking through the emergency procedures as he executed each one. He depressed both speed selector switches (beep trim) to increase the operating engine RPM and checked all instruments, which were stable.

The aircraft was in a gradual descent from 400 feet and the PUI continued to talk through the emergency procedures. He established a 15-degree right yaw and advised the HAC he was simulating fuel dump. He kept the helo flying parallel to the runway until reaching a standard 180-degree position, then commenced a single-engine approach.

He was unable to maintain altitude and advised he was simulating arming the emergency throttle. He decided to heck with simulation and depressed the emergency throttle arming switch. His turns deteriorated rapidly and the helicopter began to settle. He was

Nonstandard Procedures

suddenly in a bind. The fun and games had ended.

The HAC helped out by advancing both ECLs to FLY but in the process inadvertently moved No. 2 ECL to CRANK which shut down the engine. He didn't have enough time to open the emergency throttle actuators with the beep trim switches. The HAC hollered "I've got it," and took control of the bird as it settled toward the treetops.

Their turns had drooped too low for the generators to stay on the line so they lost all stabilization and communication equipment. With No. 1 engine accelerating, the HAC applied some up collective to arrest their descent and to avoid the higher treetops. His N_r read between 80-84 percent, and he applied forward cyclic to lower the nose. He had to bank left to avoid a big tree at 12 o'clock and the helo responded sluggishly. The tree passed close aboard the starboard side and whapped the RH stubwing.

Meanwhile, the PUI started the APP and when the HAC lowered collective, his N_r increased to 90 percent. Maybe they'd make it because their stabilization and communication equipment came back on the line. They continued to an uneventful landing and shut down. The troops came out with a tow and pulled the helicopter back to the line.

The squadron CO blamed the HAC for using a nonstandard procedure to simulate the single-engine emergency by moving both ECLs to START. Ostensibly, it was done to prevent the PUI from simply glancing at the ECL quadrant to diagnose the problem.

This nonstandard practice is fraught with hazards. Let's see why.

- With either ECL in START, the pilot is placing himself in a bad situation in the event the other engine fails or loses power. It is possible for the ECL to hang up when an emergency wouldn't allow time to get that engine on the line. That's what happened. They not only couldn't get it on the line, but shut it down in trying to advance it to FLY.
- When the engine condition circuit breaker of the operating engine is pulled, the pilot cannot trim that engine using beep. Also in this incident, with PMS down, the pilot is unable to increase the RPM of the operating engine to absorb the droop in turns created by the loss of the other engine. The pilot unnecessarily limits his N_r available for collective movements, or to cushion a landing.
- With the ECLs in START, activation of the emergency throttle arming switch causes the fuel control to function in response to the position of the ECL regardless of the position of the circuit breaker – as long as the emergency throttle actuator remains closed. With the ECLs in START, moreover, activation of the arming switch, whether intentional or not, causes the actuator to program the engine to start power.

This near strike accident could have been completely avoided by adhering to NATOPS. Nonstandard procedures in Fleet use are not discussed in the NATOPS manuals because they may be dangerous, ineffective, or undesirable. Resourceful (?) pilots keep rediscovering them and use them without the benefit of expert advice which causes them to *NOT* be addressed in the manuals. Perhaps a discussion of nonstandard procedures would be a worthwhile addition to the NATOPS program. It is recommended that this incident be given the widest possible dissemination within the helicopter community to eliminate use of nonstandard procedures.

MAYDAY! Turbulence, Ice, and Wind

A C-117D was scheduled for a ferry flight from Goose Bay to Keflavik, Iceland. During the planning stage of the flight, everything pointed toward a routine hop. As events turned out, it was anything but routine.

Departure time was 1830 local with 10 hours of fuel onboard. At Goose Bay the weather forecast indicated no significant weather enroute with winds expected to be light and variable. Estimated time enroute was 7 hours based on a TAS of 185 knots at 9000 feet.

Approximately 100 nm west of Prins Christian Sund, Greenland, the aircraft encountered broken cumulus clouds and light rime icing – still no sweat. However, 2 hours later (approximately 6 hours after takeoff) the crew flew into severe icing and turbulence in a mixture of stratus and cumulus clouds. Based on a previous observation of the tops of the clouds, the aircraft commander (LCDR Gary Woy) requested and received clearance to climb to 11,000 feet. But this wasn't effective in getting rid of the ice buildup. Since there was no improvement and ice accumulation continued, the aircraft commander descended to 600 feet AGL on the radar altimeter. Severe turbulence continued, but at least the ice started to break loose. The day's problems were not over, however; the navigator noted that the groundspeed had dropped from 190 knots to 125 knots because of strong headwinds and a reduced IAS. A rapid calculation by the navigator confirmed that there was insufficient fuel to reach Keflavik. At this point a "MAYDAY" was transmitted and the aircraft commander reversed course.

The only means of communication available to the crew was HF, and this was used to stay in touch with Iceland. After hearing the "MAYDAY," a SAR C-130 was launched from NAVSTA Keflavik.

Meanwhile, after consulting charts, checking fuel remaining, and refiguring groundspeed, the crew determined that the only available airfield within range was Narssarssuaq, Greenland, a day VMC-only field with no DOD-published instrument approach. Fifteen minutes before his ETA at Prins Christian Sund, the pilot at the controls, LCDR Doug Sherrod, climbed to 11,000 feet, the MEA between Prins Christian Sund and Narssarssuaq.

With both ADFs inoperative, LORAN was used for navigational fixes. Up to this point the fates had not been smiling very favorably on the venerable C-117 and its crew. But, while flying over a solid undercast in a worsening situation, the pilots suddenly spotted some portable airfield lighting through a break in the undercast. Taking advantage of the first good thing that had happened to them on this flight, the pilots descended through the break and found they were at Narssarssuaq. The ensuing landing was made without incident, and a flight which they are not likely to forget was ended.

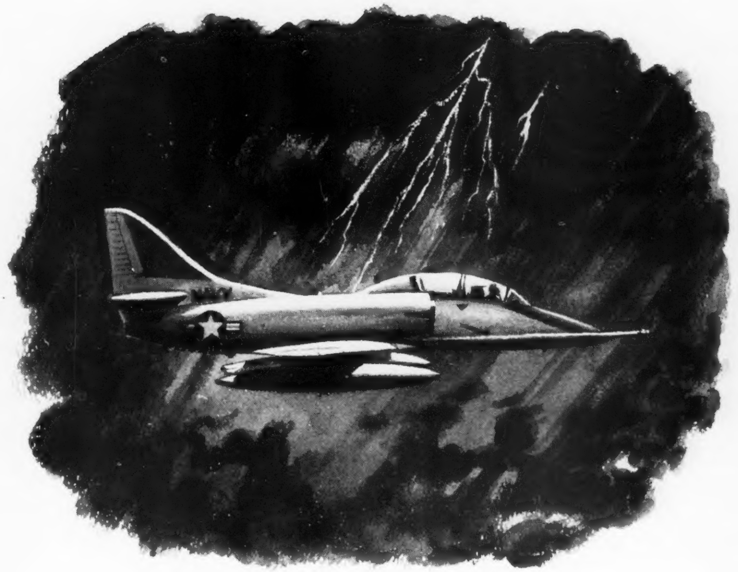
In analyzing the incident, it was found that Keflavik Metro had been forecasting severe icing for the C-117's operating envelope from Prins Christian Sund to Keflavik. But since there was no contact with Keflavik before takeoff, this vital weather information was never received at Goose Bay. As a result of this incident, all aircraft commanders were directed to attempt contact with Keflavik's Metro office for a concurrent weather brief prior to departing the last enroute stop for Keflavik.

The aircrew's immediate, collective response to a serious emergency averted a potential disaster. LCDR Woy and his crew were commended for the professional, composed manner in which they located, at night, an unfamiliar, poorly lighted airfield, from above an undercast, while having only LORAN for navigation.

The 117 crew greatly appreciated the punctual response and vital assistance rendered by the personnel of Narssarssuaq airport. Approximately 100 men and women responded to the airport's emergency siren to ensure that a serviceable airfield was available for the distressed aircraft. The manual installation of temporary runway lighting was particularly important because LCDR Woy's crew could never have located the field without it.

Bravo Zulu

LT Jeff Komenda
VA-45



IT was a windy and stormy afternoon at NAS Cecil Field when LT Jeff Komenda, VA-45, took off in his TA-4J as lead of a section scheduled to conduct a ship's service flight. The mission required positioning the aircraft 100 nm east of the ship, and the outbound flight was uneventful. Turning inbound to the ship, however, LT Komenda noticed his fuel quantity indicating less than full internal. A check of the two droptanks confirmed 1000 pounds still available. NATOPS procedures were followed in an attempt to regain droptank fuel transfer, but the external fuel remained at 1000 pounds. A few minutes later, the internal fuel quantity gauge read 3800 pounds, indicating fuel use well above normal for the power setting the pilot had been using.

LT Komenda promptly began a bingo profile for the coast. NATOPS procedures were reviewed and several procedures undertaken in an attempt to solve the several possible malfunctions causing the unexplained fuel decrease. Nothing helped, and fuel quantity continued down at an abnormally fast rate. To make things worse, LT Komenda's bingo profile was hampered by multiple lines of thunderstorms and predominant IFR conditions.

The life and death race with the fuel quantity needle began approximately 150 nm from the coast. At 100 miles, the fuel indication was 3100 pounds. TACAN lock-on with Cecil Field and radio contact with Jacksonville Center confirmed the aircraft's position almost due east of NAS Cecil. NS Mayport, although closed to normal flight operations, was closer. Jacksonville Center was informed of the problems and provided vectors around the numerous thunderstorms enroute to NS Mayport.

Approaching the coast, a heavy squall line blocked LT Komenda's path and forced his descent earlier than optimum. At this point, he was 40 nm east of the field with 1200 pounds. Just 20 nm later, only 800 pounds of fuel remained. And as if things weren't bad enough, the aircraft encountered heavy rain and turbulence at 1000 feet.

LT Komenda switched to Guard frequency 10 nm east and gave a position report in case he flamed out before reaching Mayport. Flying a modified TACAN approach, LT Komenda broke out 3 nm east of Mayport with 400 pounds indicated and successfully landed the aircraft with a 20-knot tailwind in heavy rains. At shutdown, less than 200 pounds remained in the aircraft.

Maintenance personnel repaired a fuel leak in the aircraft that had caused the high fuel depletion rate. The cause of the droptank transfer problem was determined to be a crimped air pressure line, preventing drop fuel transfer except at a very slow rate. The fact that a small amount of fuel was being transferred caused LT Komenda to retain the drops rather than jettison them when the bingo profile was commenced.

LT Komenda's immediate response to a time-critical emergency, sound judgment, and superb airmanship saved the Navy a valuable *Skyhawk* and avoided risk of personal injury. Well done.

Letters

Split the Blame

NAS Norfolk – I would like to take this opportunity to comment on the JAN '76 APPROACH article concerning A-7 brakes. First of all, I am not condoning the poor aircraft handling practices of the "Handlers," i.e., not tying down the aircraft prior to disconnecting the tow bar from the tractor. However, I do detect a note of overemphasis on the wrongdoings of the director. There are several facts which bear this out: 1) The article did not state that the plane captains were trainees; 2) If the emergency brake was applied and the wheels locked, it is extremely doubtful the aircraft would skid approximately 100 feet with a 1- or 2-degree list on the deck; and 3) The plane captain apparently did not make an all-out attempt to attract the attention of the director.

It appears too often that the air department personnel are scapegoats for the misdeeds of others. Let us *all* be objective and realistic by stating all the facts, no matter who is in error. Then and only then can we press on with the tasks at hand in a reasonable state of harmony.

ABHC W. E. Nichols
CNAL Aircraft Handling Team

P.S. I maintain a file, "Pilot vs Yellow Shirts," for occasions such as this.

• You have a good point. Rarely is an accident aboard ship the fault of any one person; usually, a combination of people and factors are involved. This handling accident was typical of this.

Your final point is also most valid. It is unfortunate that all too often the ship/air wing "team" is, in reality, the ship/air wing conflict. This stems, in large part, to a lack of understanding, on both sides, of the problems inherent with the different jobs required to launch an aircraft. Good communication and a concerted attempt to understand each other's problems are the first steps in getting the "team" together for their common task – to launch and recover aircraft expeditiously and safely.

Missed the Point

Big Spring, TX – In your JAN '76 APPROACH issue, FAA Inspector J. C. Muir asked "why no warning horn is required when a landing flap is selected" on the P-3, as this is a civil requirement which has proven nearly 100 percent effective in eliminating gear-up approaches by aircraft so equipped.

Your reply made me wonder if anyone on your staff had actually read Mr. Muir's letter. You explained that the P-3's WHEELS light is actuated by retarding the power levers, and that under some conditions (heavy aircraft, etc.), the power levers may not be retarded far enough to activate the light. So far so good; but then you said, "Since a warning horn would be activated at about the same place on the power lever quadrant, it would be no more foolproof than the light."

That wasn't at all what Mr. Muir suggested. Rather, he was referring to a system like that found on the C-141, where selecting FLAPS – LANDING activates a horn if any gear is not down and locked, *regardless of throttle position.* In the C-141, the horn cannot be silenced in this mode except by lowering the gear (or by raising the flaps).

While it's relatively easy to forget to lower one item – the gear – it's very difficult to forget both gear and flaps, making this type of warning extremely effective, especially when used as a backup to existing throttle-linked systems.

I was surprised at this lapse in your otherwise fine magazine, and I hope you don't let Lockheed-California's engineers propose anything more exotic or costly when they finish "investigating the feasibility of moving the power lever switch to correspond with a higher power setting and improving system logic to provide a more reliable warning." After all, Lockheed built the C-141, complete with the warning system just described.

Capt Steven H. Findeiss, USAF

• Your point is certainly well taken, and in retrospect, it appears that our answer to Mr. Muir's question did not really get to his point.

While a warning horn linked to flap position would be more effective than the present P-3 system, to imply that this would be a cure-all for wheels-up landings in the *Orion* would be incorrect. The flap warning system could be circumvented, for instance, in situations where a flap configuration other than landing flap was selected. This happens regularly during FAM flights, instrument approaches to minimums, and NATOPS checks.

A more effective device, in our opinion, is the GPWS (Ground Proximity Warning System) which has been strongly recommended to NAVAIRSYSCOM by the Naval Safety Center. This equipment, in addition to providing other valuable functions, will give a warning to pull up if the aircraft is within a preset altitude of the ground with no wheels down. This system is now required in commercial air carriers and is currently being tested by the Naval Air Test Center.

It is our opinion that it is more worthwhile to incorporate the GPWS than to make a modification to the existing gear

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warning system. Since the P-3 was introduced in 1962, we have experienced two near gear-up landings, one gear-up touchdown that resulted in substantial damage, and the mishap that was recently reported in APPROACH. During that same period of time, the P-3 community must have accumulated at least 1½ zillion landings, so the problem is not overwhelming. While it would be ideal to install the flap warning system *until* the GPWS can be installed, financial considerations make this impractical. The GPWS has many worthwhile functions in addition to a wheels-up warning capability, so this seems like the way to go for the long run.

An Aircraft Like Any Other

FPO, New York – I must take exception with the tone and emphasis of your article in the FEB '76 APPROACH, "Death at the Ramp." At the risk of sounding paranoid, the RA-5C *Vigilante* seems to have been again the subject of distrust and misinformation. Two points in particular are misleading.

First, the RA-5C has excellent power response on the glide slope. It is a stable aircraft which responds readily to small power changes. Additionally, it has the finest APC in the Fleet. Examples of aircraft with poor power response would be the A-7, S-3, and F-14 with their fan-jet engines and slow spool-up times. The *Vigilante's* smoke trail, so lamented in combat, is a great assist to waving the A-5 aboard, as is the long fuselage for attitude indications. Any LSO who has learned to anticipate and "lead" aircraft has no difficulty controlling the *Vigilante.* Unfortunately, men with that talent have almost vanished, and because of the present tempo of operations for all aircraft types, proper teaching of any LSO has become virtually impossible. Any aircraft that is supposedly difficult to bring aboard could not enable pilots to consistently place at the top in landing competition or have an entire squadron win "golden tailhook" for five or six grading periods during a cruise.

Secondly, and more importantly, there is nothing "more hazardous" about flying the *Vigilante.* This one superstition probably causes more problems through familiarization stage and carrier qualifications while going through the RA-5 RAG than any other factor. I wonder if BUPERS detailers relate how many officers have fought orders to *Vigilantes* on the grounds of the aircraft's reputation. If the RA-5C is really more hazardous, how about some more hazardous duty pay? (Actually, there are advantages. An RA-5C pilot gets the "you must be talented, brave, and/or crazy" treatment upon meeting a stranger in a wardroom or bar. It's sometimes worth a free drink.) However, this reputation as "hazardous" is the main support of a vicious circle; the CV deck is indeed overloaded, so when the choice is made what to leave ashore, the "hazardous" *Vigilante* is the one (with aircraft handling officers cheering in the background – forgetting the almost-as-big and more numerous F-14s and S-3s). Next, because the RA-5C spends time based ashore, either as a squadron or individual aircraft, the pilots do, in fact, start getting less carrier landings, and LSOs do see it less, with the result *Vigilante* ops will become more hazardous. The circle is then complete.

The point is the *Vigilante* is a carrier aircraft like any other. It *remains* imperative for all pilots, safety officers, and COs to make *usual* efforts to compensate for crew limitations (to paraphrase your observation). Safety in naval aviation should not be based on reputation, hearsay, or rumor. The days of "he was flying a *Cutlass* (or F8U-1, F4U, or whatever) – no wonder he crashed" are hopefully past. Modern carrier aircraft have limitations, but a good pilot is still one who is aware of those limits, and through proven procedures and techniques, stays well within those limits while consistently flying his aircraft at optimum efficiency. This is true for all aircraft with a tailhook on them – not only the RA-5C.

Next time you see me at "Breezy Point," don't ask me how tough the *Vigi* is to bring aboard; ask how the only total reconnaissance aircraft in the Navy flies, and I'll tell you . . . "Beautifully!" . . . and maybe spot you a horse.

LCDR R. R. Powell
RVAH-6

Invented Where?

Republic of Singapore – I have just seen the JUN '75 APPROACH. As usual, I enjoyed most of it, but I should like to draw your attention to the editorial response to "On Inflight Refueling," pg. 31.

I gladly concede to the USN the honour of developing the "buddy refueling system" but not the probe and drogue, mate!

Like angled decks, mirror landing aids, and steam catapults, I'm afraid you got them from the wretched Limeys.

Whilst I have my typewriter in my hand, I should like also to refer to "Bravo Zulu" on pg. 23 of the same issue. Yes, 2nd Lt Bratten certainly did a good job. But one gets the impression that his poor old instructor was nobody's fool either . . . so why not say so?

Squadron Leader D. M. Holliday, AFC, RAF

• By Jove! Good show! Bang on, old chap! You spotted our mistake and pranged us right on the nose, or should I say, drogue. Our apologies to our British friends to whom we owe so much for the present state of the art in carrier operations.

With regards to the Bravo Zulu – of course 2nd Lt Bratten's flight instructor deserves credit for imparting the knowledge and training that enabled Lt Bratten to execute his emergency landing. However, the same could be said for every pilot who ever does something well – someone instructed him. The BZ feature generally recognizes the individual most responsible for the credible performance, realizing, of course, that very often many people assist in the process.

A Petty Officer First

Cubi Point, R.P. – AC2 Press's rationale ("Control Aircraft or Scrape Paint?", FEB '76 APPROACH) for going TAD to a shore station is one that has been used by almost every AC faced with a yard period when, in fact, the usefulness of the training a CATCC controller may receive in this situation is questionable. He will, in most cases, not sharpen his knowledge of "the many characteristics of different aircraft, such as the airspace they will require to make a turn, the amount of fuel they use at different speeds," etc., because almost all shore-based ASR control in CONUS is performed by the FAA. That leaves us with PAR training. A competent controller can be away from the final control position for a number of months and regain proficiency during the workup period prior to deployment. True, it isn't going to be the smoothest operation going, but that is what the workup period is designed for.

It appears that AC2 Press has developed tunnel vision in regards to what he feels his job assignments should be. Too many Navy air traffic controllers are overly impressed with themselves, thus earning ACs a bad reputation in some quarters. A little cleaning and scraping can be a good lesson in humility. Now is the time for AC2 Press to become PO2 Press and make himself useful in that capacity.

ACCS J. E. Pilgrim

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DEPARTMENTS

A Naval Safety Center Publication

Our product is safety, our process is education, and our profit is measured in the preservation of lives and equipment and increased mission readiness.

PURPOSES AND POLICIES/APPROACH presents the most accurate information currently available on the subject of aviation accident prevention. Contents should not be considered as regulations, orders, or directives and may not be construed as incriminating under Art. 31, UCMJ. Photographs used to illustrate articles in APPROACH do not necessarily reflect the actual aircraft, air stations or ships that are described in the text.

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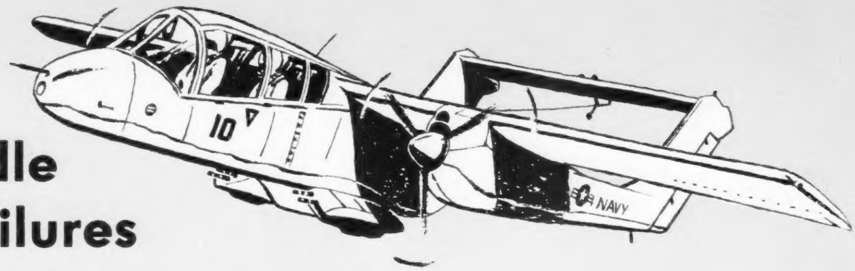
CREDITS/The Naval Air Reserve, soon to celebrate its 60th anniversary, is recognized on this month's cover painted by Safety Center artist Blake Rader. An A-7A from VA-203, NAS Jacksonville, flies escort for an RF-8G from VFP-306, NAF Washington.



Getting a Handle on Material Failures

THERE are specific shortcomings within the Navy which mitigate against reducing mishaps due to material failures. One such shortcoming is personnel. Another shortcoming centers around past and current aircraft rework programs. Aircraft are aging; tour lengths have been extended; PAR has been supplanted by new programs such as ACE, SDLM, and PDLM, which are economically sound, but still may not be engineering perfect. Another shortcoming is the lack of aircraft parts and GSE support. These shortcomings are not unique to today's climate but have steadily been building in the past years – years during which this force has consistently recorded major accident rates in the .70s with a commensurate reduction in minor accident rates and total mishap loss costs. We have handled these shortcomings successfully in the past; we must be even more aware as they grow more severe and be prepared to take new and innovative actions in the months ahead.

The specific actions which must be taken now to minimize the impact of such shortcomings and assist reversal of the material failure trend center about higher quality of maintenance with commensurate high state of alertness by personnel to signs of material failure. The following basic actions are considered necessary:

- Staffing the unit QA division with the most qualified personnel. Not only must quality assurance detect errors, but feedback to the work centers must be provided to prevent recurrence of the same errors.
- The final external examination of each aircraft prior to flight must be provided by the plane captain. His training program must be letter-perfect as must be his alertness in detecting discrepancies.
- Aircrews must be intimately familiar with their aircraft. The complexity of today's weapons system makes this a monumental task but an absolutely essential one. Proper aircrew response to a minor malfunction as well as a major malfunction is mandatory.
- Lack of parts support must not be permitted to insidiously degrade the quality of aircraft or maintenance effort. Opting for one more flight without complete investigation of a suspected discrepancy can prove to be disastrous.
- Finally, inquisitiveness about a failure can often be of great benefit. A recent carrier landing accident is an example. The accident was due to a landing gear radius rod failure with resultant gear collapse on a normal arrestment. The investigation revealed that prior to the accident the radius rod on the other gear was discovered cracked and was replaced. Had a hard landing been suspected and inspection been performed prior to the accident, perhaps a material deficiency would have been discovered in the radius rod which ultimately failed, causing the accident.

Excerpt from COMNAVAIRLANT msg

Aviators should
have seven senses:
Touch,
Taste,
Smell,
Sight,
Hearing,
Horse,
and Common.
• • • • • •
Ace L.